

Vladimir Blagojevic, Ph.D.

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Education

Columbia University, Graduate School of Arts and Sciences, New York, NY

Ph.D. in Chemistry, 2007

Ph.D. Thesis: "Synthesis and Physical Properties of Vanadium and Titanium Oxides"

M.Phil. in Chemistry, 2006

M.A. in Chemistry, 2003

University of Belgrade, Faculty of Physical Chemistry, Belgrade, Serbia

B.Sc. in Physical Chemistry, 2002

B.Sc. Thesis: "Synthesis and Characterization of Amorphous Metal Powders"

Research Experience

Research Scientist, Institute of Technical Sciences of the Serbian Academy of Sciences and Arts (2015-present)

- ◆ Head of the Laboratory for Theoretical Modeling
- ◆ Project Phase Leader: Metal-organic frameworks as materials for "green" technologies
- ◆ Development of multifunctional perovskite-type materials and polymer composites

Research Scientist, Belgrade, Serbia, affiliated with Faculty for Physical Chemistry, University of Belgrade (2009-2015) and Vida Holdings Corp. Ltd (Canada) (2009-present)

- ◆ Project Leader (collaboration with Di Carlo group, University of Rome "Tor Vergata"): investigation of modified TiO₂ electrode for dye-sensitized solar cells
- ◆ Collaboration with prof. Minic: experimental and theoretical study of thermally induced structural transformations in amorphous alloys and organometallic complex molecules, hydrogen storage in metal-organic frameworks
- ◆ Consultant for Vida Holdings Corp.: Development of new catalytic systems for automotive industry and water treatment
- ◆ Chief developer of ThermV thermokinetic analysis software package

Postdoctoral Research Fellow, University of Waterloo, Waterloo, Canada (2008-2009)

- ◆ Hybrid systems of chiral molecules and quantum dots; transition metal doped BaTiO₃ nanoparticles (magnetic characterization, Raman) as potential multiferroic materials;

Doctoral Research, Columbia University, New York, NY, (2002-2007)

Advisor: prof. Louis E. Brus

- ◆ Hydrothermal synthesis and characterization of different vanadium oxides nanocrystals and investigation phase transition dependence on size and shape of nanocrystals
- ◆ First principle calculations of large TiO₂ nanoclusters

Undergraduate Research, University of Belgrade, Belgrade, Serbia (2001-2002)
Advisor: prof. Dragica Minic

- ◆ Synthesis of amorphous powders of cobalt and nickel, hydrogen absorption/desorption

Mentoring and Teaching Experience

Mentored six graduate and more than ten undergraduate students

Currently mentoring two doctoral students

Teaching Assistant: *Intensive General Chemistry, Columbia University* (2004)

Instructed a group of 10 students in a weekly laboratory session, graded lab reports

Teaching Assistant: *General Chemistry, Columbia University* (2002-2003)

Instructed three groups of 30 students in weekly recitation sessions, graded homework assignments and quizzes

Fellowship and Awards

- Faculty Fellowship, GSAS, Columbia University (2004-2007)

Services and Leadership

- *MRSEC Educational Outreach, McNair CITIES Program* – mentored high school students in NY public schools helping them develop their projects for the science fair (2005-2007)
- *Student Parliament of the University of Belgrade* – Member of Parliament representing Faculty of Physical Chemistry (1997-1998)

Skills

Programming: FORTRAN, Python, R

DFT calculations: GAUSSIAN, Orca, Jaguar, Quantum Espresso software packages

Molecular dynamics: MD and Monte Carlo simulations in GULP, RASPA and Music packages

Materials characterization: XRD and Rietveld analysis, TG/DTA/DSC and thermokinetic analysis, Spectroscopy (UV/VIS, IR, Raman), SEM/TEM/AFM imaging

Statistics: Statistical analysis, Parametric and non-parametric optimization and data modeling

Professional Affiliations

- American Chemical Society, 2002-2008
- Serbian Physical Chemistry Society, 2001-present
- Serbian Ceramics Society, 2010-present

Publications

1. N. R. Filipović, S. Bjelogrić, T. R. Todorović, V. Blagojević, C. D. Muller, A. Marinković, M. Vujčić, B. Janović, A. Malešević, N. Begović, M. Sencanski and D. Minić, *Ni(II) complex with bis-hydrazone ligand: synthesis, characterization, DNA-binding studies and pro-apoptotic and pro-differentiation induction in human cancerous cell lines*, RSC Advances (2016) 6, 108726-108740
2. J. Živojinović, V. P. Pavlović, D. Kosanović, S. Marković, J. Krstić, V. A. Blagojević, V. B. Pavlović, *The influence of mechanical activation on structural evolution of nanocrystalline SrTiO₃ powders*, Journal of Alloys and Compounds, 2016, <http://dx.doi.org/10.1016/j.jallcom.2016.10.159>.
3. V. A. Blagojević, V. Lukić, N. N. Begović, A. M. Maričić, D. M. Minić, *Hydrogen storage in a layered flexible [Ni₂(btc)(en)₂]_n coordination polymer*, Int. J. Hydr. Energy (2016) in press, DOI: 10.1016/j.ijhydene.2016.08.203
4. A. Rašović, V. Blagojević, M. Baranac Stojanović, E. Kleinpeter, R. Marković, and D. M. Minić, *Quantification of the push-pull effect in 2-alkylidene-4-oxothiazolidines by using NMR spectral data and barriers to rotation around the C=C bond*, New. J. Chem 40 (2016) 6364-6373
5. B. Rašković; S. Vatić; B. Anđelković; V. Blagojević; N. Polović, *Optimizing storage conditions to prevent cold denaturation of trypsin for sequencing and to prolong its shelf life*, Biochemical Engineering Journal Part A, 150 (2016) 168–176
6. J. D. Zdravković, D. Poletti, J. Rogan, N. N. Begović, V. A. Blagojević, M. M. Vasić, D. M. Minić, *Thermal stability and degradation of binuclear hexaaqua-bis(ethylenediamine)-(μ₂-pyromellitate)dinickel(II) tetrahydrate*, Journal of Thermal Analysis and Calorimetry 123(2), 1715-1726, 2016
7. M. M. Vasić, P. Roupčova, N. Pizurova, S. Stevanović, V. A. Blagojević, T. Žák, D. M. Minić, *Thermally Induced Structural Transformations of Fe₄₀Ni₄₀P₁₄B₆ Amorphous Alloy*, Metallurgical and Materials Transactions A 47(1), 260-267, 2016
8. M. M. Vasić, V. A. Blagojević, N. N. Begović, T. Žák, V. B. Pavlović, D. M. Minić, *Thermally induced crystallization of amorphous Fe₄₀Ni₄₀P₁₄B₆ alloy*, Thermochemica Acta 614 (2015) 129-136
9. N. N. Begović, V. A. Blagojević, S. B. Ostojić, A. M. Radulović, D. Poletti, D. M. Minić, *Step-Wise Thermal Degradation of [Ni₂(en)₂(H₂O)₆(pyr)]·4H₂O Flexible Coordination Polymer*, Mat. Chem. Phys 149-150 (2015), 105-112.
10. N. N. Begović, N. N. Stojanović, S. B. Ostojić, A. M. Radulović, V. A. Blagojević, D. M. Minić, *Thermally induced polymerization of binuclear [Ni₂(en)₂(H₂O)₆(pyr)]·4H₂O complex*, Thermochemica Acta 607 (2015) 82-91
11. N. N. Begović, V. A. Blagojević, S. B. Ostojić, D. M. Micić, N. Filipović, K. Anđelković, D. M. Minić, *Thermally Induced Structural Transformations of a Series of Palladium(II) Complexes with N-Heteroaromatic Bidentate Hydrazone Ligands*, Thermochemica Acta 592 (2014) 23 – 30
12. D. M. Minić, V. A. Blagojević, *Hydrothermal Synthesis and Ligand Controlled Growth of Vanadium Oxide Nanostructures*, CrystEngComm, 2013, 15 (33), 6617 – 6624
13. M. Vasić, D. M. Minić, V. A. Blagojević, D. M. Minić, *Kinetics and mechanism of thermally*

induced crystallization of amorphous Fe_{73.5}Cu₁Nb₃Si_{15.5}B₇ alloy, Thermochem. Acta 584 (2014) 1-7

14. N. Begović, M. Vasić, A. Grković, V. Blagojević, Dragica Minić, *Isokinetic parameters of thermal degradation of powder of [Cd(N-Boc-gly)₂(H₂O)₂]_n*, Sci. Sintering, 46(3) (2014) 323-330
15. M. Šumar-Ristović, D. M. Minić, V. Blagojević, K. Anđelković, *Kinetics of Multi-Step Processes of Thermal Degradation of Co(II) Complex With N-Benzyl oxycarbonylglycinato Ligand. Deconvolution of DTG Curves*, Science of Sintering, 46(1) (2014) 37-53
16. V. A. Blagojević, M. Vasić, B. David, D. M. Minić, N. Pizúrová, T. Žák, D. M. Minić, *Microstructure and Functional Properties of Fe_{73.5}Cu₁Nb₃Si_{15.5}B₇ amorphous alloy*, Mater. Chem. Phys., 145 (2014) 12-17
17. V. A. Blagojević, M. Vasić, B. David, D. M. Minić, N. Pizúrová, T. Žák, D. M. Minić, *Thermally induced crystallization of Fe_{73.5}Cu₁Nb₃Si_{15.5}B₇ amorphous alloy*, Intermetallics, 45 (2014) 53-59
18. M. Vasić, D. M. Minić, V. A. Blagojević, D. M. Minić, *Mechanism of Thermal Stabilization of Fe₈₁Si₄B₁₃C₂ amorphous alloy*, Thermochem. Acta, 572 (2013) 45-50
19. V. A. Blagojević, N. Obradović, N. Cvjetičanin, D. M. Minić, *Influence of dimensionality on phase transition in VO₂ nanocrystals*, Sci. Sintering, 45(3) (2013) 305-311
20. V. A. Blagojević, M. Vasić, D. M. Minić, D. M. Minić, *Thermally Induced Structural Transformations and Their Effect on Functional Properties of Fe_{89.8}Ni_{1.5}Si_{5.2}B₃C_{0.5} amorphous alloy*, Mater. Chem. Phys., 142 (2013) 207-212
21. M. Vasić, D. M. Minić, V. A. Blagojević, D. M. Minić, *Mechanism of Thermal Stabilization of Fe_{89.8}Ni_{1.5}Si_{5.2}B₃C_{0.5} Amorphous Alloy*, Thermochem. Acta, 562 (2013) 35-41
22. D. Minić, V. Blagojević, D. Minić, *Influence of Thermal Treatment on Functional Properties of Fe₈₁Si₄B₁₃C₂ amorphous alloy*, Tehnika 3/2013 (2013) 439-450
23. V. A. Blagojević, M. Vasić, D. M. Minić, D. M. Minić, *Kinetics and thermodynamics of thermally induced structural transformations of amorphous Fe₇₅Ni₂Si₈B₁₃C₂ alloy*, Thermochem. Acta, 549 (2012) 35-41
24. D. M. Minić, V. A. Blagojević, D. M. Minić, *Influence of thermal treatment on structure and functional properties of Fe₇₅Ni₂Si₈B₁₃C₂ amorphous alloy*, Hemijska Industrija - Chemical Industry (in Serbian), 66(5) (2012) 769-780
25. D. M. Minić, V. A. Blagojević, D. M. Minić, B. David, N. Pizúrová, T. Žák, *Nanocrystal growth of iron nanorods in thermally treated Fe₇₅Ni₂Si₈B₁₃C₂ amorphous alloy*, Metall. Mater. Trans. A 43 (2012) 3062-3069
26. M. Šumar-Ristović, M. Gruden-Pavlović, M. Zlatar, V. Blagojević, K. Anđelković, D. Poleti, D. Minić, *Kinetics, mechanism and DFT calculations of thermal degradation of Zn(II) complex with N-benzyloxycarbonylglycinato ligand*, Monatshefte für Chemie - Chemical Monthly, 143 (2012) 1133-1139
27. D. M. Minić, V. A. Blagojević, A. M. Maričić, T. Žák, D. M. Minić, *Influence of structural transformations on functional properties of Fe₇₅Ni₂Si₈B₁₃C₂ amorphous alloy*, Mater. Chem. Phys. 134 (2012) 111-115

28. D. M. Minić, V. A. Blagojević, D. M. Minić, B. David, N. Pizúrová, T. Žák, *Influence of thermal treatment on microstructure of $Fe_{75}Ni_2Si_8B_{13}C_2$ amorphous alloy*, *Intermetallics* 25 (2012) 75-79
29. D. M. Minić, V. A. Blagojević, D. M. Minić, A. Gavrilović, T. Žák, *Influence of microstructural inhomogeneity of individual sides of $Fe_{81}Si_4B_{13}C_2$ amorphous alloy ribbon on thermally induced structural transformations*, *Mater. Chem. Phys.* 130 (2011) 980-985
30. A. Maričić, D.M. Minić, V. A. Blagojević, A. Kalezić-Glišović, D. M. Minić, *Effects of structural relaxation on functional properties of amorphous alloy $Fe_{73.5}Cu_1Nb_3Si_{15.5}B_7$* , *Intermetallics* 21 (2012) 45-49
31. V. A. Blagojević, D. M. Minić, T. Žák, D. M. Minić, *Influence of thermal treatment on structure and microhardness of $Fe_{75}Ni_2Si_8B_{13}C_2$ amorphous alloy*, *Intermetallics* 19 (2011) 1780-1785
32. D. M. Minić, V. A. Blagojević, D. M. Minić, A. Gavrilović, L. Rafailović, T. Žák, *Influence of microstructure on microhardness of $Fe_{81}Si_4B_{13}C_2$ amorphous alloy after thermal treatment*, *Metall. Mater. Trans. A*, 42 (2011) 4106-4112
33. D. G. Minić, V. A. Blagojević, Lj. E. Mihajlović, V. R. Čosović, D. M. Minić, *Kinetics and mechanism of structural transformations of $Fe_{75}Ni_2Si_8B_{13}C_2$ amorphous alloy induced by thermal treatment*, *Thermochim. Acta*, 519(2011) 83-89
34. D. M. Minić, V. Blagojević, D. G. Minić, A. Gavrilović, L. Rafailović, *Influence of thermally induced structural transformations on hardness in $Fe_{89.8}Ni_{1.5}Si_{5.2}B_3C_{0.5}$ amorphous alloy*, *J. Alloys. Compd.* 509 (2011) 8350-8355
35. V. A. Blagojevic, J. P. Carlo, L. E. Brus, M. L. Steigerwald, Y. J. Uemura, S. J. L. Billinge, W. Zhou, P. W. Stephens, A. A. Aczel, and G. M. Luke; *Magnetic Phase Transition in V_2O_3 Nanocrystals*, *Phys. Rev. B* 82 (2010) 094453 (6 pages)
36. V. A. Blagojevic, Y. R. Chen, M. L. Steigerwald, R. Friesner, L. E. Brus, *Quantum Chemical Investigation of Cluster Models for TiO_2 Nanoparticles with Water-Derived Ligand Passivation: Studies of Excess Electron States and Implications for Charge Transport in the Graetzel Cell*; *J. Phys. Chem. C* 113 (46) (2009) 19806-19811
37. D. M. Minić, V. A. Blagojević, D. M. Minić, *Fe-Based Nanocomposite Formed by Thermal Treatment of Amorphous $Fe_{81}B_{13}Si_4C_2$ Alloy*, *Crystallization / Book 1*, Editor: M. R. B. Andreetta, InTech, ISBN 979-953-307-624-8 (2012) (26 pages)
38. D. M. Minić, V. A. Blagojević, D. M. Minić, *Mechanism and kinetics of crystallization of $Fe_{75}Ni_2Si_8B_{13}C_2$ amorphous alloy*, *Amorphous Materials: New Research*, Nova Science, ISBN: 978-1-62417-718-7 (2013) pp. 95-122
39. V. A. Blagojević, J. Grbović-Novaković, D. G. Minić, D. M. Minić, *Hydrogen As Energy Storage Material: Challenges and Perspectives*, *Hydrogen Energy*, Editor: D. M. Minić, InTech, ISBN 980-953-307-277-2, (2013) doi: 10.5772/46098 (28 pages)